

ABSTRACT

An electrolytic apparatus for using catalyst-coated hollow microspheres to produce gases, store them, and to make them available for later use. The apparatus uses catalyst-coated hollow microspheres in reversible electrochemical processes and reactions, such as those used in conjunction with water dissociation, fuel cells, and rechargeable batteries. The apparatus can be used to manufacture and store hydrogen and or oxygen and to make them available for subsequent use as raw materials for use in electrochemical and chemical reactions or as a fuel and or oxidizer for a combustion engine. The apparatus can be used as a hydrogen-oxygen hermetically seal secondary battery. The apparatus can be used as a hydrogen storage portion of certain types of secondary batteries. Hydrogen and oxygen can be stored within hollow microspheres at moderate temperature and pressure, eliminating the need for expensive storage and handling equipment, and increasing the mobility of hydrogen-powered vehicles. Storage of hydrogen and or oxygen within the microspheres significantly reduces flammability and explosion concerns and resolves many fuel cell scalability issues.

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